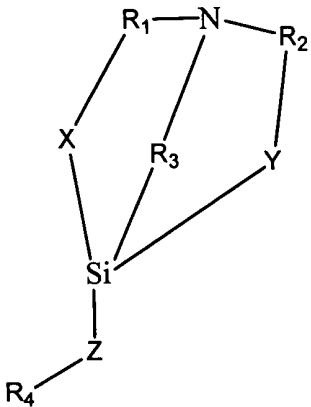


What is claimed is:

1. A cyclic silane having the formula



wherein R₁, R₂ R₃ and R₄ are independently alkyl, functionalized alkyl, aryl or alkoxy and X, Y and Z are independently a bond, O, S, NR₅, wherein R₅ is H, alkyl, substituted alkyl, or aryl.

2. A cyclic silane according to claim 1 wherein X , Y and Z are O.

3. A cyclic silane according to claim 2 wherein R₁, R₂, R₃ and R₄ are independently C₁ to C₁₀ alkyl.

4. A cyclic silane according to claim 3 wherein R₁, R₂ and R₄ are ethyl.

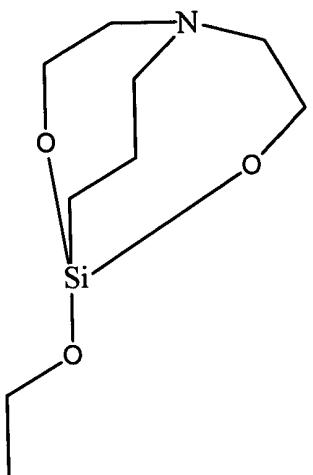
5. A cyclic silane according to claim 3 wherein R₁ and R₂ are ethyl and R₄ is methyl.

6. A cyclic silane according to claim 4 wherein R₃ is propyl.

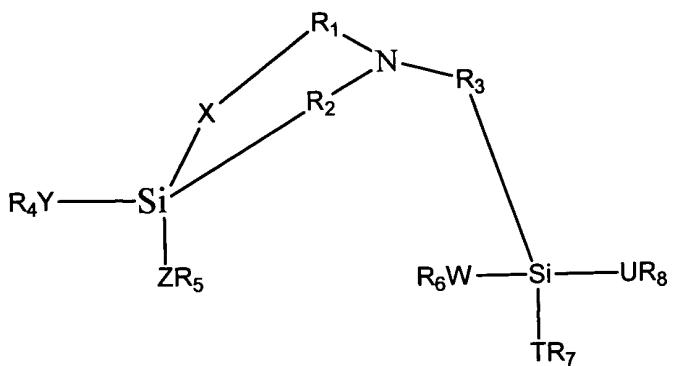
7. A cyclic silane according to claim 1 wherein R₁ and R₂ are alkoxy.

8. A cyclic silane according to claim 1 wherein R₁ and R₂ are (CH₂CH₂O)_n wherein n is 1-4 and X and Y are bonds and Z is O.

9. A cyclic silane having the formula



10. A cyclic silane having the formula



wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 and R_8 are independently alkyl, functionalized alkyl, aryl or alkoxy and T , R , U , X , Y , Z are independently a bond, O, S, NR_9 , wherein R_9 is H, alkyl, substituted alkyl, or aryl.

11. A cyclic silane according to claim 10 wherein T , R , U , X , Y , Z are O.

12. A cyclic silane according to claim 11 wherein R_4 , R_5 , R_6 , R_7 , and R_8 are ethyl.

13. A cyclic silane according to claim 11 wherein wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇ and R₈ are, independently, C₁ to C₁₀ alkyl.

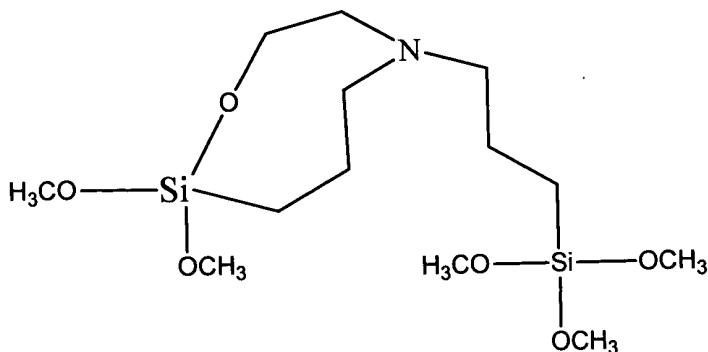
14. A cyclic silane according to claim 13 wherein R₄, R₅, R₆, R₇ and R₈ are methyl.

15. A cyclic silane according to claim 14 wherein R₁ is ethyl, R₂ is propyl and R₃ is propyl.

16. A cyclic silane according to claim 10 wherein R₁ is alkoxy.

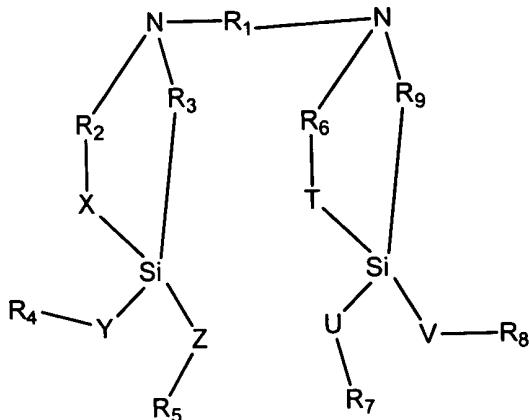
17. A cyclic silane according to claim 16 wherein R₁ is (CH₂CH₂O)_n wherein n is 1-4 and X is a bond.

18. A cyclic silane having the formula



19. A composition of matter comprising a substantially pure cyclic silane according to any of claims 1-18, above.

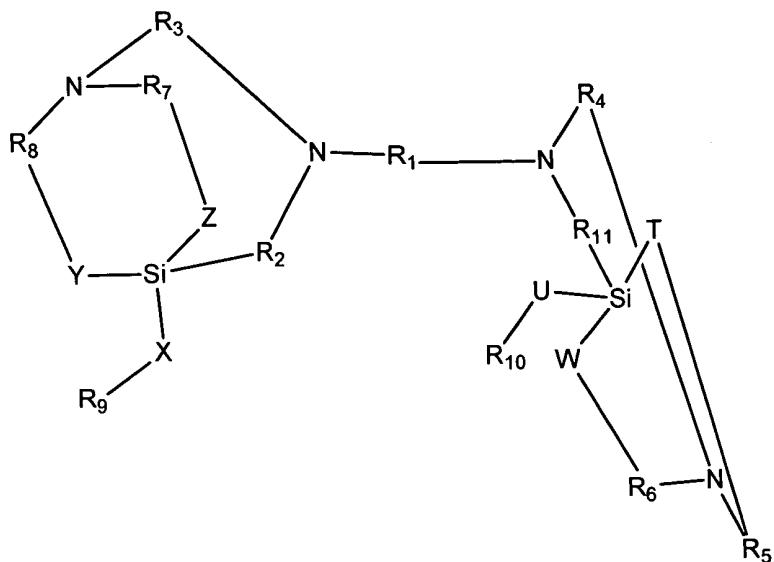
20. A cyclic silane having the formula



wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, and R₉ are alkyl, substituted alkyl, aryl, or alkoxy; and T, U, V, X, Y, and Z are O, S, NHR₁₀, wherein R₁₀ is H, alkyl, substituted alkyl, or aryl.

21. A cyclic silane according to claim 20 wherein R₁, R₂, and R₆ are ethyl, R₄, R₅, R₇ and R₈ are methyl and R₃ and R₉ are propyl (-CH₂-)₃; and T, U, V, X, Y, and Z are O.

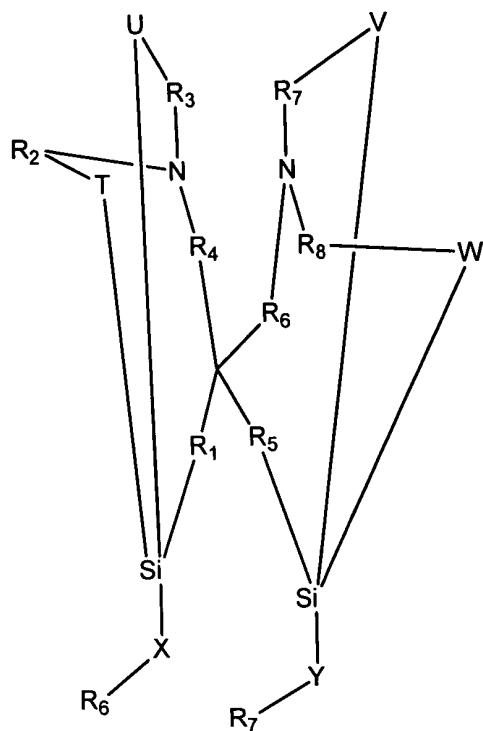
22. A cyclic silane having the formula:



wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, R₉, R₁₀ and R₁₁ are alkyl, substituted alkyl, aryl, or alkoxy and T, U, W, X, Y, and Z are O, S, NHR₁₂, wherein R₁₂ is H, alkyl, substituted alkyl, or aryl.

23. A cyclic silane according to claim 22 wherein T, U, W, X, Y and Z are O; and R₁, R₃, R₄, R₅, R₆, R₇, R₈ are ethyl, R₂ and R₁₁ are propyl (-CH₂-)₃, and R₉ and R₁₀ are methyl.

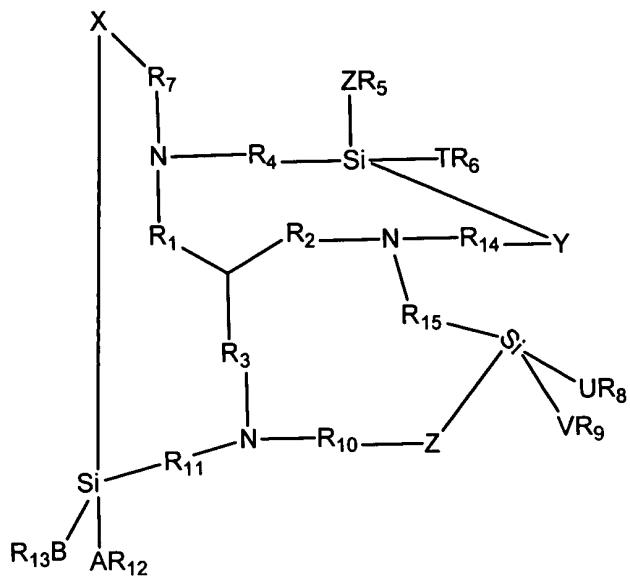
24. A cyclic silane having the formula:



wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, and R₈ are alkyl, substituted alkyl, aryl, or alkoxy and T, W, X, and Y are O, S, NHR₁₁, wherein R₁₁ is H, alkyl, substituted alkyl, or aryl.

25. A cyclic silane according to claim 24 wherein R₆ and R₇ are methyl, R₁ and R₅ are propyl (-CH₂-)₃, R₂, R₃, R₄, and R₈ are ethyl and T, W, X, and Y are O.

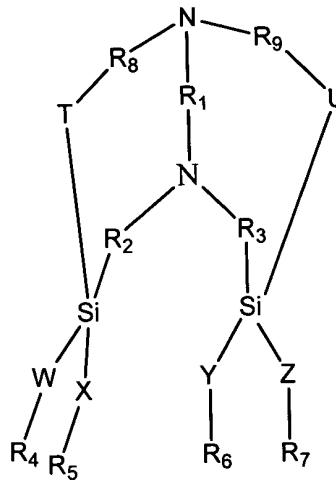
26. A cyclic silane having the formula:



wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , R_9 , R_{10} , R_{11} , R_{12} , R_{13} , R_{14} , and R_{15} are alkyl, substituted alkyl, aryl, or alkoxy and A , B , T , U , V , X , Y and Z are O , S , NHR_{16} , wherein R_{16} is H, alkyl, substituted alkyl, or aryl.

27. A cyclic silane according to claim 26 wherein R_4 , R_{11} , and R_{15} are propyl ($-CH_2-CH_2-CH_2-$), R_1 , R_2 , R_3 , R_5 , R_6 , R_7 , R_8 , R_9 , R_{10} , R_{12} , R_{13} , R_{14} are ethyl, and A , B , T , U , V , X , Y and Z are O.

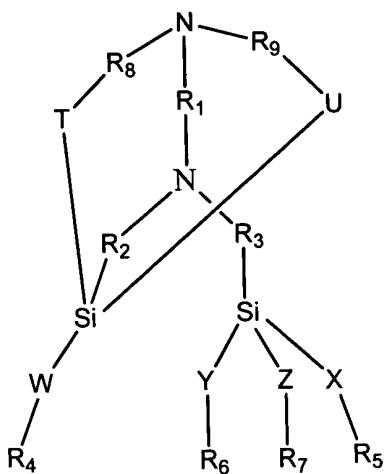
28. A cyclic silane having the formula



wherein R₁, R₂, R₃, R₅, R₆, R₇, R₈, and R₉, are alkyl, substituted alkyl, aryl, or alkoxy and T, U, W, X, Y and Z are O, S, NHR₁₀, wherein R₁₀ is H, alkyl, substituted alkyl, or aryl.

29. A cyclic silane according to claim 28 wherein R₁, R₂ and R₃ are propyl (-CH₂-)₃, R₄, R₅, R₆, R₇, R₈, and R₉ are ethyl and T, U, W, X, Y, and Z are O.

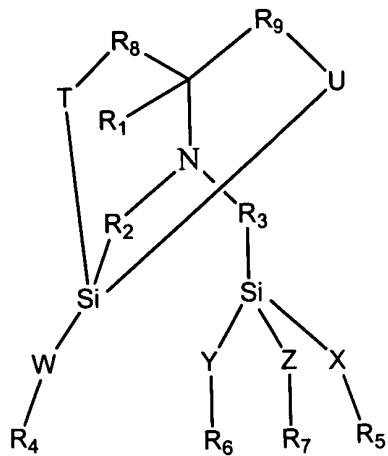
30. A cyclic silane having the formula



wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, and R₉, are alkyl, substituted alkyl, aryl, or alkoxy and T, U, W, X, Y and Z are O, S, NHR₁₀, wherein R₁₀ is H, alkyl, substituted alkyl, or aryl.

31. A cyclic silane according to claim 30 wherein R₁, R₂ and R₃ are propyl (-CH₂-)₃, R₄, R₅, R₆, R₇, R₈, and R₉ are ethyl and T, U, W, X, Y, and Z are O.

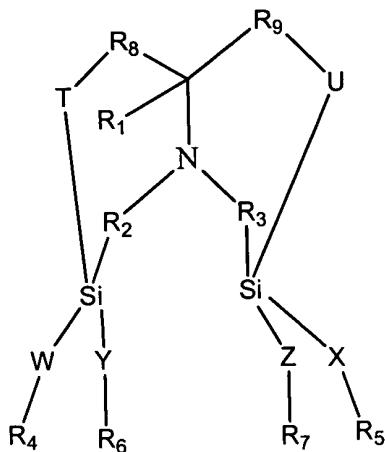
32. A cyclic silane having the formula



wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, and R₉, are alkyl, substituted alkyl, aryl, or alkoxy and T, U, W, X, Y and Z are O, S, NHR₁₀, wherein R₁₀ is H, alkyl, substituted alkyl, or aryl.

33. A cyclic silane according to claim 32 wherein R₂ and R₃ are propyl (-CH₂-)₃, R₁, R₈ and R₉ is methyl, R₄, R₅, R₆, R₇ are ethyl and T, U, W, X, Y, and Z are O.

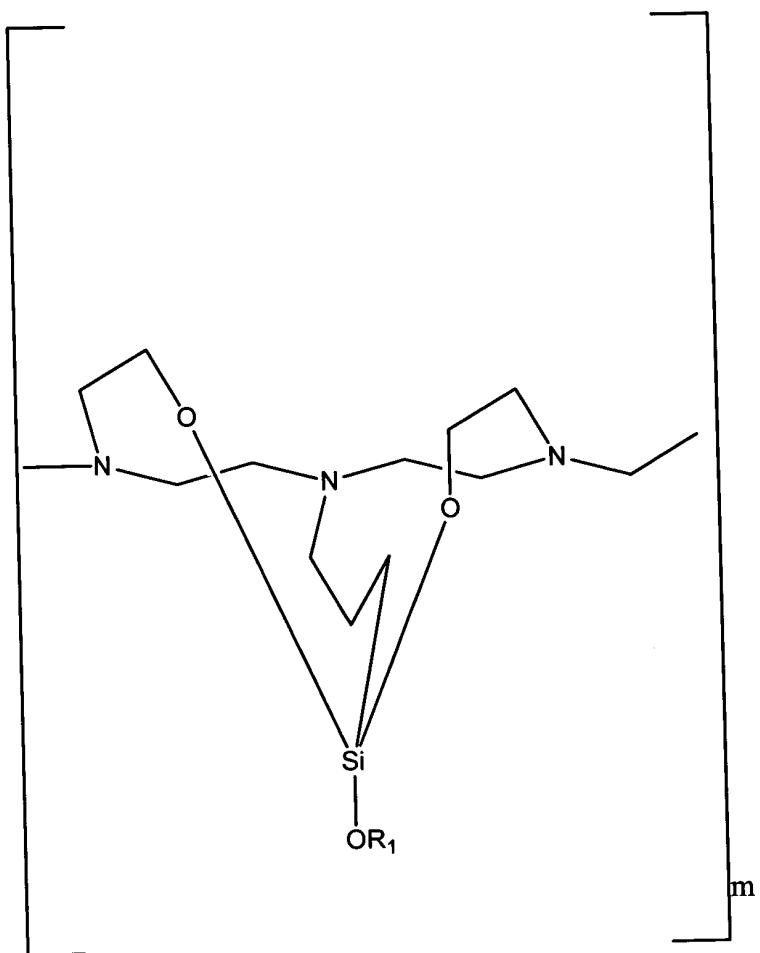
34. A cyclic silane having the formula



wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, and R₉, are alkyl, substituted alkyl, aryl, or alkoxy and T, U, W, X, Y and Z are O, S, NHR₁₀, wherein R₁₀ is H, alkyl, substituted alkyl, or aryl.

35. A cyclic silane according to claim 34 wherein R₂ and R₃ are propyl (-CH₂-)₃, R₁, R₈ and R₉ are methyl, R₄, R₅, R₆, R₇ are ethyl and T, U, W, X, Y, and Z are O.

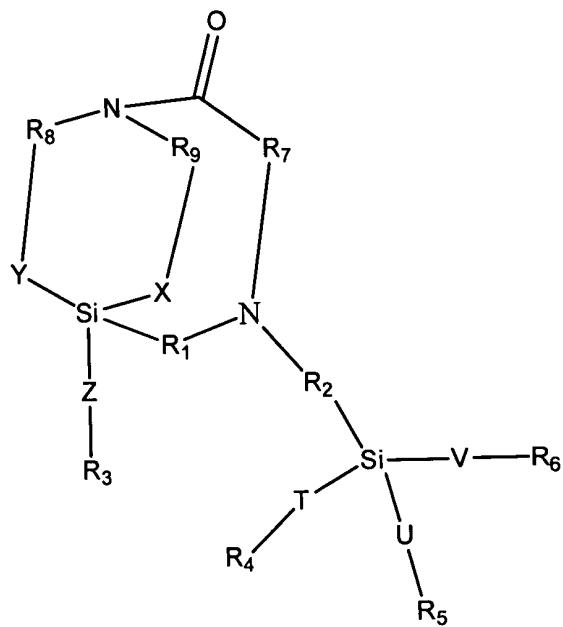
36. A cyclic silane having the formula:



wherein R_1 is alkyl, substituted alkyl, aryl, or alkoxy and repeating and m is an integer from 5 to 10,000.

37. A cyclic silane according to claim 36 wherein R_1 is methyl or ethyl.

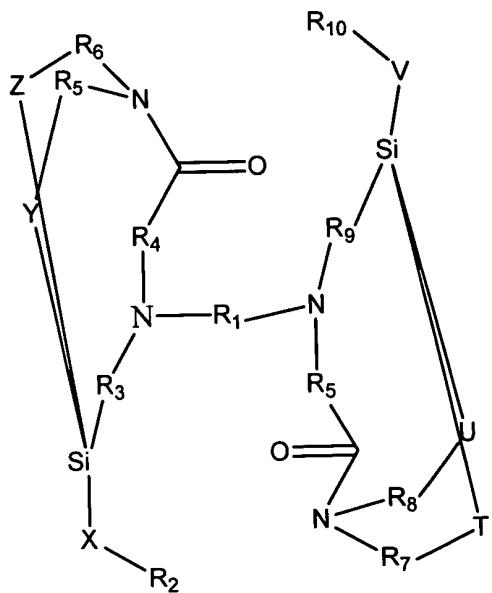
38. A cyclic silane having the formula



wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, and R₉, are alkyl, substituted alkyl, aryl, or alkoxy and T, U, V, X, Y and Z are O, S, NHR₁₀, wherein R₁₀ is H, alkyl, substituted alkyl, or aryl.

39. A cyclic silane according to claim 38 wherein R₃, R₄, R₅ and R₆ are methyl, R₁ and R₂ are propyl (-CH₂)₃, R₇, R₈, and R₉ are ethyl and T, U, V, X, Y and Z are O.

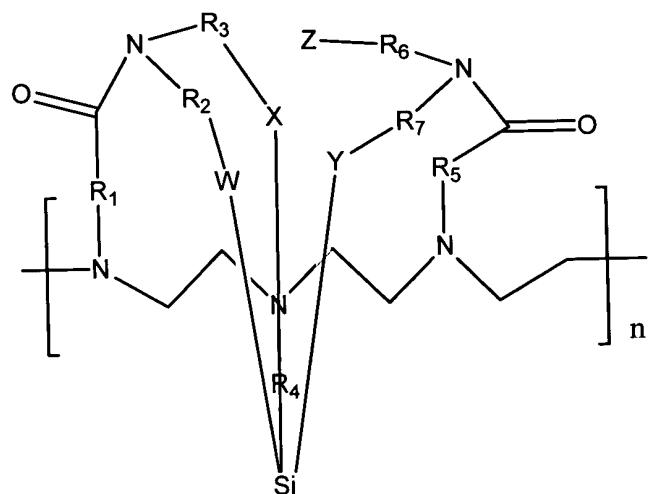
40. A cyclic silane having the formula



wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, R₉, and R₁₀ are alkyl, substituted alkyl, aryl, or alkoxy and T, U, V, X, Y and Z are O, S, NHR₁₁, wherein R₁₁ is H, alkyl, substituted alkyl, or aryl.

41. A cyclic silane according to claim 40 wherein R₁, R₄, R₅, R₆, R₇ and R₈ are ethyl, R₃ and R₉ are propyl, R₂ and R₁₀ are methyl, and T, U, V, X, Y, and Z are O.

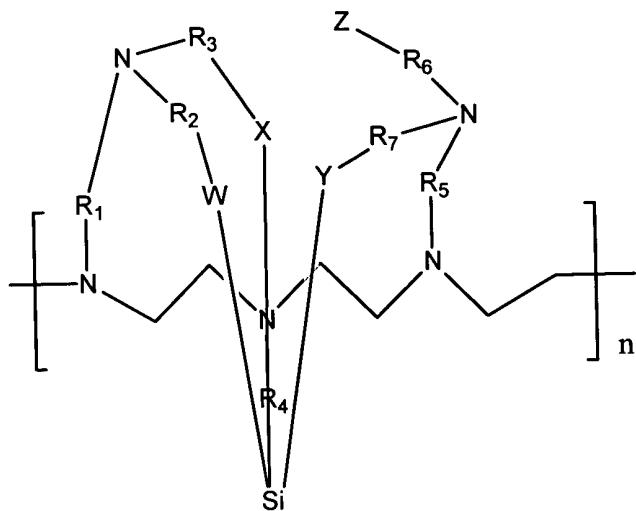
42. A cyclic silane having the formula



wherein R₁, R₂, R₃, R₄, R₅, R₆, and R₇ are alkyl, substituted alkyl, aryl, or alkoxy and W, X, Y and Z are O, OH, S, NHR₈, wherein R₈ is H, alkyl, substituted alkyl, or aryl and n is an integer from 5 to 10,000.

43. A cyclic silane according to claim 42 wherein R₄ is propyl, R₁, R₂, R₃, R₅, R₆, and R₇ are ethyl and W, X, Y and Z are O or OH.

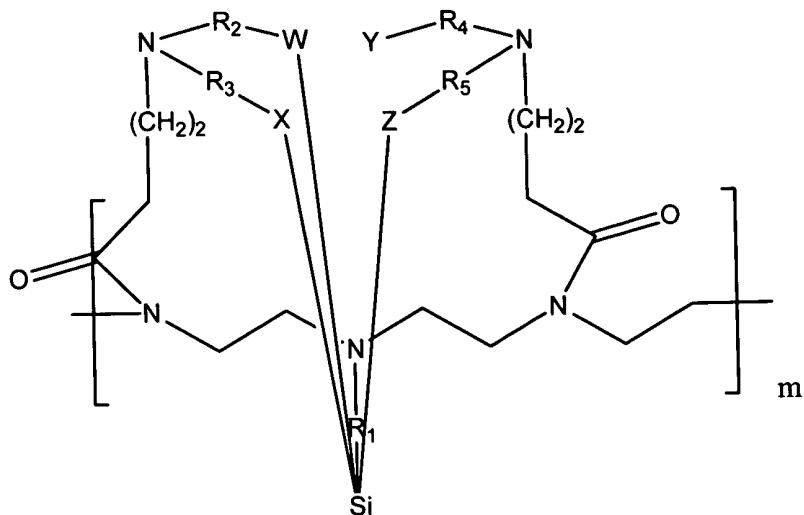
44. A cyclic silane having the formula



wherein R₁, R₂, R₃, R₄, R₅, R₆, and R₇ are alkyl, substituted alkyl, aryl, or alkoxy and W, X, Y and Z are O, OH, S, NHR₈, wherein R₈ is H, alkyl, substituted alkyl, or aryl and n is an integer from 5 to 10,000.

45. A cyclic silane according to claim 44 wherein R₄ is propyl, R₁, R₂, R₃, R₅, R₆, and R₇ are ethyl and W, X, Y and Z are O or OH.

46. A cyclic silane having the formula



wherein R₁, R₂, R₃, R₄ and R₅ are alkyl, substituted alkyl, aryl, or alkoxy and W, X, Y and Z are O, OH, S, NHR₆, wherein R₆ is H, alkyl, substituted alkyl, or aryl and m is an integer from 5 to 10,000.

47. A cyclic silane according to claim 46 wherein R1 is propyl (-CH₂-)₃, R₁, R₂, R₃, and R₅ are ethyl and W, X, Y and Z are O or OH.

48. A composition of matter comprising a substantially pure cyclic silane according to any of claims 20-47, above.